Homework 2

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Simulation & Analysis

M = 64, N = 16, T = 100

Cores	Execution Time (s)	Speedup
1	0.419368	*BASELINE*
2	0.246927	1.698
4	0.120609	3.477
8	0.063945	6.558
16	0.054824	7.649
32	0.033798	12.408
64	0.027130	15.458

M = 128, N = 256, T = 500

Cores	Execution Time (s)	Speedup
1	0.420161	*BASELINE*
2	0.208426	2.016
4	0.112855	3.723
8	0.059931	7.011
16	0.054770	7.671
32	0.030343	13.847
64	0.022028	19.0740

M = 512, N = 512, T = 1000

Cores	Execution Time (s)	Speedup
1	6.297009	*BASELINE*
2	3.118339	2.019
4	1.600067	3.935
8	0.826053	7.623
16	0.502244	12.538

32	0.302900	20.789
64	0.263758	23.874

All of the simulations saw a substantial speedup as more cores were used to run the program. The larger the board used in the game, the larger the speedup was. This is because the program can take advantage of the parallelization better when more data has to be processed. The communication overhead that occurred between processes, even at 64 cores, did not affect the execution time of the program very much.